

REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

I. SUMMARY OF THE CLAIMS

Withdrawn claims 14-37 and 39-49 are canceled. Applicants reserve the right to prosecute the subject matter of the canceled claims in this or another application.

Claims 50, 59, and 62 are currently being amended. Support for these amendments can be found throughout the specification as-filed, including page 10, lines 24 and 25 (listing examples of biological species).

This amendment adds, changes and/or deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

Because the foregoing amendments do not introduce new matter, entry thereof by the Examiner is respectfully requested.

After amending the claims as set forth above, claims 50-65 are pending and being examined on the merits.

II. CLAIM REJECTIONS – 35 U.S.C. § 112, SECOND PARAGRAPH

Claim 59 and 62-65 stand rejected under 35 U.S.C. § 112, second paragraph, as allegedly “being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.” Office action at 2. Specifically, the examiner rejects claim 59 for the recitation “wherein the material” and rejects claim 62 for omitting a word. While not acquiescing the propriety of the rejection, Applicants have amended claim 59 to insert “inorganic” before “material” and amended claim 62 to add “wherein the carrier is” before “pre-treated,” as suggested by the examiner. Thus, Applicants respectfully request reconsideration and withdrawal of this ground of rejection against claims 59 and 62.

III. CLAIM REJECTIONS – 35 U.S.C. § 102

A. U.S. Patent No. 6,312,916 by Kopetzki *et al.*

Claims 50, 51, 54, 55, and 61-65 stand rejected under 35 U.S.C. § 102(e) as allegedly anticipated by U.S. Patent No. 6,312,916 by Kopetzki *et al.* (Kopetzki). Applicants respectfully traverse this ground for rejection.

1. Summary of Kopetzki

Kopetzki discloses “muteins of avidin and streptavidin with a reduced binding affinity for biotin.” Kopetzki abstract. These muteins can be used as “an interference reagent for assays to detect an analyte which contains the streptavidin/avidin-biotin binding pair as a test component.” Kopetzki at col. 5, ll. 20-22. In other words, Kopetzki provides muteins of avidin and streptavidin which bind to biotin or biotinylated substances for use in assays, for example. Kopetzki at col. 5, ll. 34-43. Thus, the interaction of Kopetzki is between a mutein of streptavidin or avidin and biotin.

2. Kopetzki does not teach or suggest a “biomolecular interaction”

In contrast, Applicants’ claims recite a biomolecular interaction between biological species, “wherein the biological species are selected from the group consisting of proteins, polypeptides, peptides, amino acids, DNA, RNA and phospholipids.” Biotin is not one of these biological species and is instead a water-soluble B vitamin. *See* Exhibit A. Thus, Kopetzki does not teach or suggest the “biomolecular interaction,” as claimed. Accordingly, Applicants respectfully request reconsideration and withdrawal of this ground of rejection against claims 50, 51, 54, 55, and 61-65.

B. U.S. Patent No. 6,395,299 by Babich *et al.*

Claims 50-65 stand rejected under 35 U.S.C. § 102(e) as allegedly anticipated by U.S. Patent No. 6,395,299 by Babich *et al.* (Babich). Applicants respectfully traverse this ground for rejection.

1. Summary of Babich

Babich discloses matrices for drug delivery, such as a matrix containing reaction centers that converts L-dopa to dopamine for the treatment of Parkinson's disease. Babich abstract. The matrices can be made of sol-gels, such as silica-based sol-gels. Babich at col. 28, ll. 57-59. The reaction centers can be attached to the matrix through a biotin molecule covalently attached to the matrix. Babich at col. 29, ll. 50-64. For example, the biotin is covalently linked to a silica alkoxide, and the reaction center is attached to avidin. *Id.* Thus, "the biotin/avidin interaction would effectively attach the reaction center [] to the [] matrix." Babich at col. 29, ll. 60-63.

2. Babich does not teach or suggest an "entrapped" biomolecular interaction

The bound molecules in the matrix of Babich, which the examiner appears to consider a "biomolecular interaction," are not "entrapped" by the matrix. Instead, one of the components, biotin, is covalently attached to the matrix. Covalent attachment to the matrix is not equivalent to a biomolecular interaction "entrapped" by a carrier. *See* the Specification at page 9, ll. 29-31. Thus, Babich does not teach or suggest the "entrapped" aspect of the claimed invention.

3. Babich does not teach or suggest a "biomolecular interaction [] that can be reversibly disrupted from the other under reversibly disrupting conditions"

Babich discloses that an antibody may be bound to the matrix and a hapten can be used to attach a reaction center to the antibody. However, Babich does not teach or suggest that this antibody-hapten linkage could be "reversibly disrupted from the other under reversibly disrupting conditions." In fact, Babich uses the reaction centers attached to the matrix to produce biologically active agents over an extended period, such as "a period of several months." Babich at col. 57, ll. 28-32. If Babich's interaction were reversible, it would allow the reaction center to diffuse from the matrix rendering Babich's invention inoperative. Thus, there is no teaching or suggestion that Babich's interaction could be "reversibly disrupted from the other under reversibly disrupting conditions."

4. Babich does not teach or suggest Applicants' claimed "biomolecular interaction"

Finally, in contrast to Babich, the present claims recite a biomolecular interaction between biological species, "wherein the biological species are selected from the group consisting of proteins, polypeptides, peptides, amino acids, DNA, RNA and phospholipids." Biotin is not one of these biological species and is instead a water-soluble B vitamin, as noted above in Section II(A). *See* Exhibit A. Thus, Babich does not teach or suggest the "biomolecular interaction," as claimed.

Accordingly, for at least these reasons, Babich does not teach or suggest the claimed invention. Thus, Applicants respectfully request reconsideration and withdrawal of this ground of rejection.

Conclusion

The present application is now in condition for allowance. Favorable reconsideration of the application's amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to

Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. § 1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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oxygen demand

in numbers or elimination of pest
by interference with their ecology
the introduction of parasites or diseases

oxygen demand noun (1945)

oxygen demand noun (1946)

involving the use of living organisms
(or their toxic products as
also warfare involving the use of

oxygen demand noun (1924)

involving biological explanations
analysis of social situations

oxygen demand adjective

oxygen demand noun (German *Biologie*,
1819)

branch of knowledge that deals with liv-
ing organisms and vital processes

of plant and animal life of a region or
of the life processes especially

of a group; broadly: **ecology**

oxygen demand noun

oxygen demand noun [International Scientific Vocabulary
(1916)]

of light from living organisms;
the light so produced

oxygen demand adjective

oxygen demand noun (1934)

of amount of living matter (as in a unit
of volume of habitat)

of materials and animal waste used es-
pecially as a source of fuel

oxygen demand noun

used for or suitable for use in pros-
ect that come in direct contact with living

oxygen demand noun plural but usually singular

of special use in biology and

oxygen demand adjective

oxygen demand noun

oxygen demand noun [2bi- + -ome] (1916)

ecological community type (as trop-
ical forest, grassland, or desert)

oxygen demand noun

but singular or plural in construction

(1933)

mechanics of biological and especially

activity (as in locomotion or

also the scientific study of this

oxygen demand adjective

oxygen demand adjective

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oxygen demand adjective

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bio-mol-e-cule \bi-ō-'mä-li-kyū(ə)\ noun

(1901)

: an organic molecule and especially a macro-
molecule in living organisms

— **bio-mol-ec-ular** \mā-'le-kyā-lər\ ad-
jective

bio-mor-phic \bi-ō-'mōr-fik\ adjective (1895)

: resembling or suggesting the forms of living
organisms (biomorphic sculptures) (biomor-
phic images)

bi-on-ic \bi-'ā-nik\ adjective (1963)

1 : of or relating to bionics

2 : having normal biological capability or per-
formance enhanced by or as if by electronic or
electromechanical devices

bi-on-ics \bi-'ā-niks\ noun plural but singular
or plural in construction [2bi- + -onics (as in
electronics)] (1960)

: a science concerned with the application of
data about the functioning of biological sys-
tems to the solution of engineering problems

bi-o-nom-ics \bi-ō-'nā-miks\ noun plural but
singular or plural in construction (bionomic,
adjective, probably from French *bionomique*,
from *bionomie* ecology, from bi- + -nomie
-nomy) (1888)

— **bi-o-nom-ic** \mīk\ adjective

bio-phys-ics \bi-ō-'fi-ziks\ noun plural but
singular or plural in construction (1892)

: a branch of science concerned with the appli-
cation of physical principles and methods to
biological problems

— **bio-phys-i-cal** \zi-kəl\ adjective

— **bio-phys-i-cist** \fi-zā-sist, -fiz-sist\
noun

bio-pic \bi-ō-'pik\ noun [2bi- + 'pic] (1951)

: a biographical movie

bio-poly-mer \bi-ō-'pā-lə-mər\ noun (1961)

: a polymeric substance (as a protein or
polysaccharide) formed in a biological system

bi-op-sy \bi-ō-'sāf-tē\ noun, plural -sies [Inter-
national Scientific Vocabulary 2bi- + -opsy (as
in *autopsy*)] (1895)

: the removal and examination of tissue, cells,
or fluids from the living body

— **biopsy** transitive verb

bio-re-act-or \bi-ō-rē-'ak-tər\ noun (1974)

: a device or apparatus in which living organ-
isms and especially bacteria synthesize useful
substances (as interferon) or break down
harmful ones (as in sewage)

bio-rhythm \bi-ō-'ri-thəm\ noun (1960)

: an inherent rhythm that appears to control or
initiate various biological processes

— **bio-rhyth-mic** \ri-th-mik\ adjective

bio-safe-ty \bi-ō-'sāf-tē\ noun (1977)

: safety with respect to the effects of biological
research on humans and the environment

bio-science \bi-ō-'sai-əns\ noun (1941)

: BIOLOGY 1; also: LIFE SCIENCE

— **bio-sci-en-tific** \sī-ən-'ti-fik\ ad-
jective

— **bio-sci-en-tist** \sī-ən-'tist\ noun

bio-sen-sor \bi-ō-'sen-sər, -sen(t)-sər\ noun
(1962)

: a device that is sensitive to a physical or
chemical stimulus (as heat or an ion) and
transmits information about a life process

-biosis noun combining form, plural -bioses

[New Latin, from Greek *biōsis*, from *bioun* to
live, from *bios* life — more at QUICK]

: mode of life (parabiosis)

bio-so-cial \bi-ō-'sō-shəl\ adjective (1897)

: of, relating to, or concerned with the interac-
tion of the biological aspects and social rela-
tionships of living organisms (biosocial sci-
ence)

— **bio-so-cial-ly** \sōsh-lē, -sō-shə-\ ad-
verb

bio-sphere \bi-ō-'sfir\ noun (1899)

1 : the part of the world in which life can exist

2 : living beings together with their environ-
ment

— **bio-spher-ic** \bi-ō-'sfir-ik, -sfer-\ ad-
jective

bio-sta-tis-tics \bi-ō-stā-'tis-tiks\ noun plu-
ral but singular in construction (1950)

: statistics applied to the analysis of biological
data

— **bio-sta-tis-ti-cal** \ti-kəl\ adjective

— **bio-stat-is-ti-cian** \stā-tə-'sti-shən\
noun

bio-strat-i-graph-ic \bi-ō-strā-'grā-fik\ ad-
jective (1947)

: of or relating to the branch of paleontology
dealing with the conditions and order of depo-
sition of sedimentary rocks

— **bio-strat-ig-ra-phy** \strā-'ti-grā-fē\
noun

bio-syn-the-sis \bi-ō-'sin(t)-thə-səs\ noun [New
Latin] (1930)

: the production of a chemical compound by a
living organism

— **bio-syn-thet-ic** \sin-'the-tik\ adjective

— **bio-syn-thet-i-cal-ly** \ti-k(ə)-lē\ ad-
verb

bio-sys-te-mat-ics \bi-ō-'sis-tə-'ma-tiks\ noun
plural but singular or plural in construction
(1945)

: experimental taxonomy especially as based
on cytogenetics and genetics

— **bio-sys-te-mat-ic** \tik\ adjective

— **bio-sys-tem-atist** \sis-tə-mə-tist, -sis-
tə-mə-\ noun

bi-ō-ta \bi-ō-'tā\ noun [New Latin, from Greek
biotē life; akin to Greek *bios*] (1901)

: the flora and fauna of a region

bio-tech \bi-ō-'tek\ noun (1974)

: BIOTECHNOLOGY 1

bio-tech-ni-cal \bi-ō-'tek-ni-kəl\ adjective
(1938)

: of or relating to biotechnology

bio-tech-nol-o-gy \bi-ō-'tek-'nā-lə-jē\ noun
(1941)

1 : applied biological science (as bioengineer-
ing or recombinant DNA technology)

2 : ERGONOMICS

— **bio-tech-no-log-i-cal** \tek-nə-'lāj-i-
kəl\ adjective

— **bio-tech-nol-o-gist** \nā-lə-jist\ noun

bio-te-lem-e-try \bi-ō-'le-mə-trē\ noun (1963)

: the remote detection and measurement of a
human or animal function, activity, or condi-
tion

— **bio-tele-met-ric** \te-lə-'me-trik\ ad-
jective

bi-ot-ic \bi-'ā-tik\ adjective [Greek *biōtikos*,
from *bioun*] (1868)

: of or relating to life; especially : caused or
produced by living beings (biotic diversity)

-biotic adjective combining form [probably
from New Latin *-bioticus*, from Greek *biōti-
kos*]

: having a (specified) mode of life (endobiot-
ic)

biotic potential noun (1935)

: the inherent capacity of an organism or spe-
cies to reproduce and survive

bi-o-tin \bi-ō-'tən\ noun [International Scientif-
ic Vocabulary, from Greek *biotōs* life, suste-
nance; akin to Greek *bios*] (1936)

: a colorless crystalline growth vitamin
C₁₀H₁₆N₂O₃S of the vitamin B complex found
especially in yeast, liver, and egg yolk

bi-o-tite \bi-ō-'tīt\ noun [German *Biotit*, from
Jean B. Biot (died 1862) French mathemati-
cian] (1862)

: a generally black or dark green form of mica
that is a constituent of crystalline rocks and
consists of a silicate of iron, magnesium, po-
tassium, and aluminum

— **bi-o-tit-ic** \bi-ō-'ti-tik\ adjective

bio-tope \bi-ō-'tōp\ noun [2bi- + Greek *topos*
place] (1927)

\ə\ about \ə\ kitten \ər\ further \ə\ ash \ā\ ace
\ā\ mop, mar \au\ out \ch\ chin \e\ bet \ē\ easy
\g\ go \i\ hit \i\ ice \j\ job \ŋ\ sing \ō\ go
\ō\ law \oi\ boy \th\ thin \th\ the \u\ loot \u\ foot
\y\ yet \zh\ vision see also Guide to Pronunciation

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